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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/021,743	12/12/2001	Michael Halle	ZOG-009	5619
21323	7590	04/15/2004	EXAMINER	
TESTA, HURWITZ & THIBEAULT, LLP HIGH STREET TOWER 125 HIGH STREET BOSTON, MA 02110			ALLEN, DENISE S	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 04/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/021,743	Applicant(s) HALLE ET AL.	
	Examiner Denise S Allen	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11,453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments with respect to claims 1 – 23 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 – 12 and 14 – 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Ezra et al (US 5,703,717).

Regarding claims 1 and 12, Ezra et al teaches a lens array (Figure 4 reference 36) comprising an array of lens elements having a backplane (reference 35) for reproducing an image (small blocks on reference 35) located at the backplane, each lens having a non-unitary magnification (compare the small blocks on reference 35 and the blocks of reference 31, column 4 lines 47 – 49) and reproducing visual information from the backplane to a finite conjugate region (reference 31, column 3 lines 38 – 39) in free space such that the reproduced visual information overlaps with visual information reproduced in free space by at least one neighboring lens element (reference 31 is a superposition of the small blocks on reference 35 reproduced by the lens elements in reference 36).

Regarding claims 2 and 14, Ezra et al teaches the visual information is reproduced by the lens elements as a stereoscopic image (column 4 line 11).

Regarding claims 3 and 15, Ezra et al teaches a source of visual information on the backplane, the visual information comprising pixels each constituting a discrete component of visual information, each lens element producing an aerial image comprising multiple pixels simultaneously viewable at the conjugate region (column 4 lines 42 – 49).

Regarding claims 4 and 16, Ezra et al teaches the visual information produced in free space varies with a viewing angle (column 4 lines 25 – 29), the lens elements having lens pitch (column 4 lines 42 – 45 indicates a lens pitch of 0.5mm) defining center-to-center distances there between and cooperating to reproduce an image having a spatial resolution (column 4 lines 34 – 36 indicates a spatial resolution of 65 mm) distinct from the lens pitch.

Regarding claims 5 and 17, Ezra et al teaches the lens elements cooperate to reproduce an image having a spatial resolution greater than the lens pitch ( $65\text{mm} > 0.5\text{mm}$ ).

Regarding claims 6 and 18, Ezra et al teaches the lens elements have magnifications ranging from 1:8 to 1:100 (column 4 lines 32 – 49: equates to a magnification of 1:130).

Regarding claims 7 and 19, Ezra et al teaches the lens elements cooperate to project a finite conjugate field to a series (reference 31) of inherently curved quadratic surfaces in free space. As illustrated by Hecht, the conjugate field produced by a lens is inherently curved (Figure 6.25). This curvature is the Petzval field curvature, which is quadratic by definition (Equation 6.43).

Regarding claims 8 and 20, Ezra et al teaches quadratic surfaces produced by each of the lens elements intersect, forming a mosaic virtual field having locally varying spatial and angular resolutions (Figure 4).

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Regarding claims 9 and 21, Ezra et al teaches the lens elements have a residual field curvature (as described above as Petzval field curvature) so as to vary locally in magnification, the mosaic virtual field and varied magnification facilitating visual decorrelation of images individually produced by the lens elements (column 4 lines 25 – 31).

Regarding claims 10 and 22, Ezra et al teaches the lens elements have a residual field curvature (as described above as Petzval field curvature) so as to vary locally in magnification, the lenses providing an angular resolution increasing toward a center of a viewing field and a spatial resolution increasing at peripheral angular locations (column 4 lines 50 – 60).

Regarding claims 11 and 23, Ezra et al teaches a degree of visual-information overlap determines a rate at which spatial resolution decreases with distance from the center of the viewing field (column 4 lines 50 – 60).

Regarding claim 12, Ezra et al teaches the image having a spatial resolution and varying with viewing angle according to an angular resolution (column 4 lines 32 – 38), the spatial and angular resolutions of the image inherently vary with the magnifications of the lens elements, and the magnification is selected corresponding to a predetermined angular and spatial image resolution (column 4 lines 38 – 41).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ezra et al in view of Hecht.

Ezra et al teaches the means for producing an aerial image as described above. Ezra et al does not teach a means for varying the distance between the visual information and the backplane to vary the magnification.

Hecht teaches that varying the distance between visual information (Figure 5.26 the man to the left of the lens) and the backplane of a lens varies the resulting magnification (compare the sizes of the images of the man to the right of the lens). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the varying distance of Hecht in the means for producing an aerial image of Ezra et al in order to vary the magnification in order to produce the proper size image.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise S Allen whose telephone number is (571) 272-2305. The examiner can normally be reached on Monday - Friday, 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

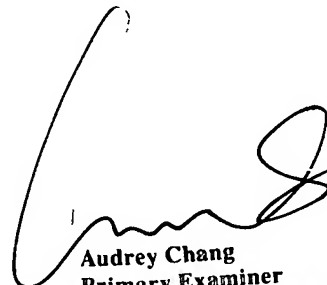
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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



dsa

Denise S Allen  
Examiner  
Art Unit 2872



Audrey Chang  
Primary Examiner  
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